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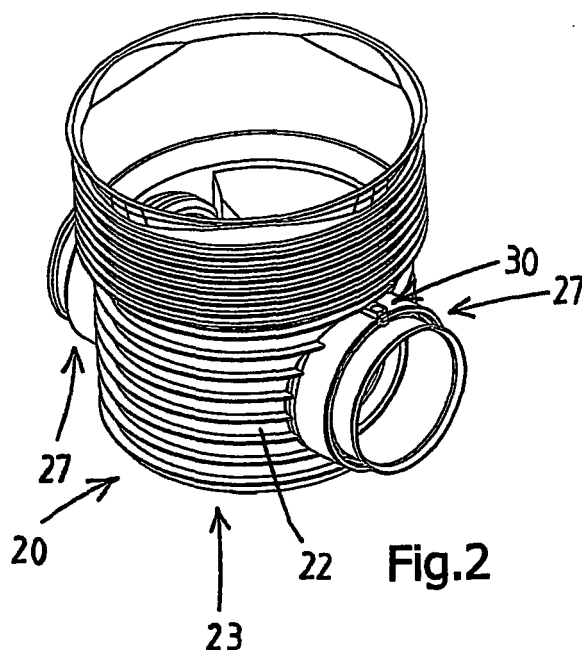
(54) **Sewer and rainwater drainage gully element**

(57) A sewer and rainwater drainage gully element of a sewer and rainwater drainage gully to be placed in the ground, to which gully one or more pipes can be connected for the purpose of draining away liquid arriving in the gully through a gully opening and/or for the purpose of ensuring that liquid arriving at the gully through one or more pipes connected to the gully is carried on to one or more other pipes connected to the gully.

The sewer and rainwater drainage gully element is provided with at least one levelling device, which is fitted detachably on the gully element if desired.

The levelling device is preferably provided on the outside of the gully element.

The levelling device can be a spirit level filled with liquid in which an air bubble is present. For example, the spirit level is a round spirit level.



**Fig.2**

## Description

**[0001]** The invention relates to a sewer and rainwater drainage gully element of a sewer and rainwater drainage gully to be placed in the ground, to which gully one or more pipes can be connected for the purpose of draining away liquid arriving in the gully through a gully opening which may be present, and/or for the purpose of ensuring that liquid arriving at the gully through one or more pipes connected to the gully is carried on to one or more other pipes connected to the gully.

**[0002]** Such sewer and rainwater drainage gullies are used on a large scale in sewer and rainwater drainage systems. The gully can be, for example, a street inlet with a gully opening protected by a swivelling, often grate-type gully cover on the top. Such street inlets are relatively small. The gully can, however, be a large inspection gully with a manhole on the top and possibly with a shaft offering space to the person carrying out the inspection. An example of such a gully is disclosed in WO 97/48859. It is known to make both the street inlets and the inspection gullies largely or fully of plastic material. The gully can be in one piece, but the gully can also be composed of a number of parts, for example with a gully bottom element which is combined with other gully elements (for example with a shaft element or shaft elements) to form a gully.

**[0003]** The functioning of a sewer and rainwater drainage system with one or more gullies and pipes requires accurate positioning of the gullies, inter alia on account of the pitch - the angle of inclination - of the one or more parts of the gully along which liquid flows. An incorrect position of the gully can adversely affect that flow and possibly contribute to the occurrence of blockages. An incorrect position of the gully is also disadvantageous for connecting one or more pipes to the gully. An incorrect position is likewise troublesome if the gully has on the top a cover, grate or the like which is supposed to lie flush with a street surface or the like.

**[0004]** In order to ensure the correct position of the gully when placing a sewer and rainwater drainage gully, it is known to use a levelling device. This can be a simple level which the installer holds against a surface of the gully during the placing. Special levelling devices specifically designed for checking the position during the placing of a sewer and rainwater drainage gully are also known. See, for example, US 4 653 193.

**[0005]** Despite the awareness of the necessity for placing a sewer and rainwater drainage gully in the correct position, and even the existence of levelling devices specially developed for the purpose, it is found in practice that an undesirably large number of mistakes are made. This leads to the sewer and rainwater drainage system not functioning efficiently and/or to the necessity for correction of the position by digging out the gully again and repositioning it.

**[0006]** The object of the invention is to provide an improved sewer and rainwater drainage gully element, in

particular a gully element which the person or persons involved in the installation can easily place in the correct position.

**[0007]** To this end, the invention provides a sewer and rainwater drainage gully element according to claim 1, which is characterized in that the sewer and rainwater drainage gully element is provided with a levelling device.

**[0008]** Since the sewer and rainwater drainage gully element according to the invention itself is provided with one or more levelling devices, and is supplied in that state to the installer, the one or more persons involved in placing of the gully have a more or less constant view of the position of the gully during the placing process, or at any rate have the possibility of constantly checking said position.

**[0009]** This measure, which is simple to achieve per se, provides a solution to a large number of situations leading to mistakes still occurring in practice at the present time.

**[0010]** For instance, installers often place an ordinary level on a part of the gully element which is actually not suitable/intended as a reference for the correct position of the gully, for example on a sloping part of a gully bottom element.

**[0011]** Since the work is often being carried out in an environment with sand and/or mud, in the case of the known gullies measuring errors are often made owing to the fact that the level and/or the reference surface is dirty.

**[0012]** It is furthermore ensured by the invention that installers, on account of pressure of work or on account of insufficient availability of a levelling device (for example because several gullies are being placed at a location at the same time), do not omit to carry out the check on the position of the gully with a separate levelling device.

This also avoids the problem of the position actually being checked with a separate levelling device at a particular time, but the position being changed later on in the placing process without this change being noticed, for example when the hole for the gully and/or for connecting one or more pipes to the gully is being filled up with soil.

**[0013]** The one or more levelling devices can be fitted in such a way on the sewer and rainwater drainage gully element that after installation of the gully they can be detached by the installer. It is, however, also conceivable for the one or more levelling devices to be permanently connected to the gully element.

**[0014]** A levelling device of the type with a spirit level is preferably provided. As is known, a spirit level has a plastic liquid-filled reservoir which is at least partially transparent and in which an air bubble is present. The position of the air bubble is then an indication of the position of the levelling device, it being preferable for a desired position for the air bubble and/or a scale division representative of the angle of inclination to be provided by one or more lines on the levelling device. Such spirit levels can be produced at low cost, in fact as a mass-produced product. The abovementioned advantages to be achieved with the invention are such that the costs of

providing the gully elements with one or more of such spirit levels are more than justified.

**[0015]** A spirit level can be tubular and thus indicate the angle of inclination in one direction. By using two of such spirit levels in a square arrangement, it is possible to check the position in two directions simultaneously. A round spirit level which simultaneously indicates the position in two directions can also be used.

**[0016]** Further advantageous embodiments of the sewer and rainwater drainage gully element according to the invention are described in the subclaims and the description which follows with reference to the drawing.

**[0017]** The invention furthermore relates to a sewer and rainwater drainage gully according to claim 15, and also to a method according to claim 16.

**[0018]** In the drawing:

Fig. 1 shows in side view (partially in section) an example of an inspection gully of a sewer and rainwater drainage system to be placed in the ground;  
Fig. 2 shows in perspective an example of a gully bottom element for an inspection gully;  
Fig. 3 shows a detail of Figure 2 on a larger scale;  
Fig. 4 shows the gully bottom element of Figure 2 in top view;  
Fig. 5 shows the gully bottom element of Figure 2 in side view;  
Fig. 6 shows the gully bottom element of Figure 2 in front view.

**[0019]** Figure 1 shows an inspection gully 1, here as an example to illustrate the invention. The gully shown is the same as the gully shown and described in WO 97/48859, but it will be clear that the gully can also be designed differently.

**[0020]** Two pipes can be connected to this gully 1. Said pipes and the gully 1 form part of a sewer and rainwater drainage system.

**[0021]** The gully 1 here is provided with a manhole on the top and has a shaft which can accommodate a person.

**[0022]** The gully 1 shown is composed of a number of essentially stacked elements, and here has a gully bottom element 2, a shaft element 3 (or a number of shaft elements 3), a cone element 4 with a manhole 5, which can be closed by a manhole cover.

**[0023]** In the embodiment shown an annular concrete element 7 is provided, which concrete element is placed on the top of the cone element 5, and on which a supporting ring 8 for the cover is placed.

**[0024]** It is also known to design such an inspection gully with a top part which is stacked on the cone part and on which a manhole cover is placed directly. Such a top part can be telescopic in order to ensure that the lid is ultimately flush with the surrounding street surface.

**[0025]** The gully 1 is placed in the ground by first setting up the bottom element 2 and then stacking the other elements 3, 4 on top of it.

**[0026]** The gully bottom element 2 here has two connecting sockets 9 for pipes (not shown), situated diametrically opposite each other. In the interior the element 2 has a floor with a channel 9a which is open at the top, so that the water can flow from the one pipe to the other. As already mentioned, the bottom element 2 can also be provided with a different number of pipe connections and/or be provided in a different arrangement, in which case the floor is then designed differently with one or more channels in it.

**[0027]** The position of the bottom element 2 is very important for reasons already mentioned above. The invention in this example provides for the gully bottom element 2 to have one or more levelling devices. Said levelling devices are fitted here already during the production of the gully bottom element 2, so that the element 2 provided with one or more levelling devices is delivered to the site.

**[0028]** In this example a single round spirit level 10 can be fitted on the outside of the bottom element 2, here on top of a connecting socket 9.

**[0029]** Figs 2 - 5 show in greater detail a gully bottom element 20 according to the invention, which is substantially the same as the element 2.

**[0030]** The element 20 has a bottom wall 22 and an external peripheral wall 23, which in this example is substantially cylindrical. A pipe connecting socket 27 is provided in the external peripheral wall 23 for connection of each of the pipes. Said pipe connecting socket 27 connects the pipe to the internal liquid conveyance space of the element 2, which in this case comprises a connecting channel bounded by the bottom wall 22 and open at the top.

**[0031]** Fitted on top of the outwardly projecting part of connecting socket 27 is a levelling device 30, in this case a round spirit level. For the purpose of retaining the spirit level 30, removably here, in an accurately positioned position, a retaining mechanism 31, a clamping mechanism here, is fitted on the element 2.

**[0032]** As is preferable, the bottom element 2 is made of plastic. It is also preferable here for the retaining mechanism 31 to be moulded integrally along with the bottom element 2.

**[0033]** The clamping mechanism 31 here has a groove 32 into which the spirit level 30 is pushed, which groove 32 is formed here by two ribs between which the spirit level 30 goes in a close fit.

**[0034]** It will be clear that the round spirit level 30 indicates the angle of inclination of the bottom element 2 in all directions, the circular line on the spirit level 30 indicating what position the air bubble needs to have if the element 2 has the correct position established by the producer.

**[0035]** The placing of the spirit level 30 on the outside of the element 2 makes it easier for the installer standing beside the element 2 to see the spirit level 30, and to adjust the ground if necessary in order to obtain the correct position.

**[0036]** It will be clear that a spirit level 30 could also be provided at the other socket 27, so that it does not matter at which side the installer stands. A gully bottom element is provided at each connecting socket if necessary.

**[0037]** It is also conceivable for the element concerned, element 2 here, to be provided with a number of retaining mechanisms at various points for a spirit level, and at a smaller number of points, at least one point, for a spirit level actually to be fitted detachably. When performing the installation the installer can then if desired fit a spirit level at another, preferably more easily readable point, in the retaining mechanism present there.

**[0038]** As an alternative and/or in combination with a spirit level on the outside, it is also possible to provide a spirit level on the inside of the element, for example in the floor of the bottom element 2. For example, a spirit level can be provided at point A in Figure 4, here in the floor of the gully.

**[0039]** The retaining mechanism can be in the form of a cavity, bore, recess or another opening in the body of the element concerned, in which the spirit level is fixed in a suitable manner (for example with adhesive), preferably in such a way that the spirit level does not project, so that damage is prevented.

**[0040]** It is also conceivable for the spirit level to be fitted in a "projecting position" on the body of the element concerned, for example with the underside of the spirit level fixed (for example self-adhesively) on a surface of the element.

**[0041]** It will be clear that a spirit level can also be provided along a vertical wall of the element concerned.

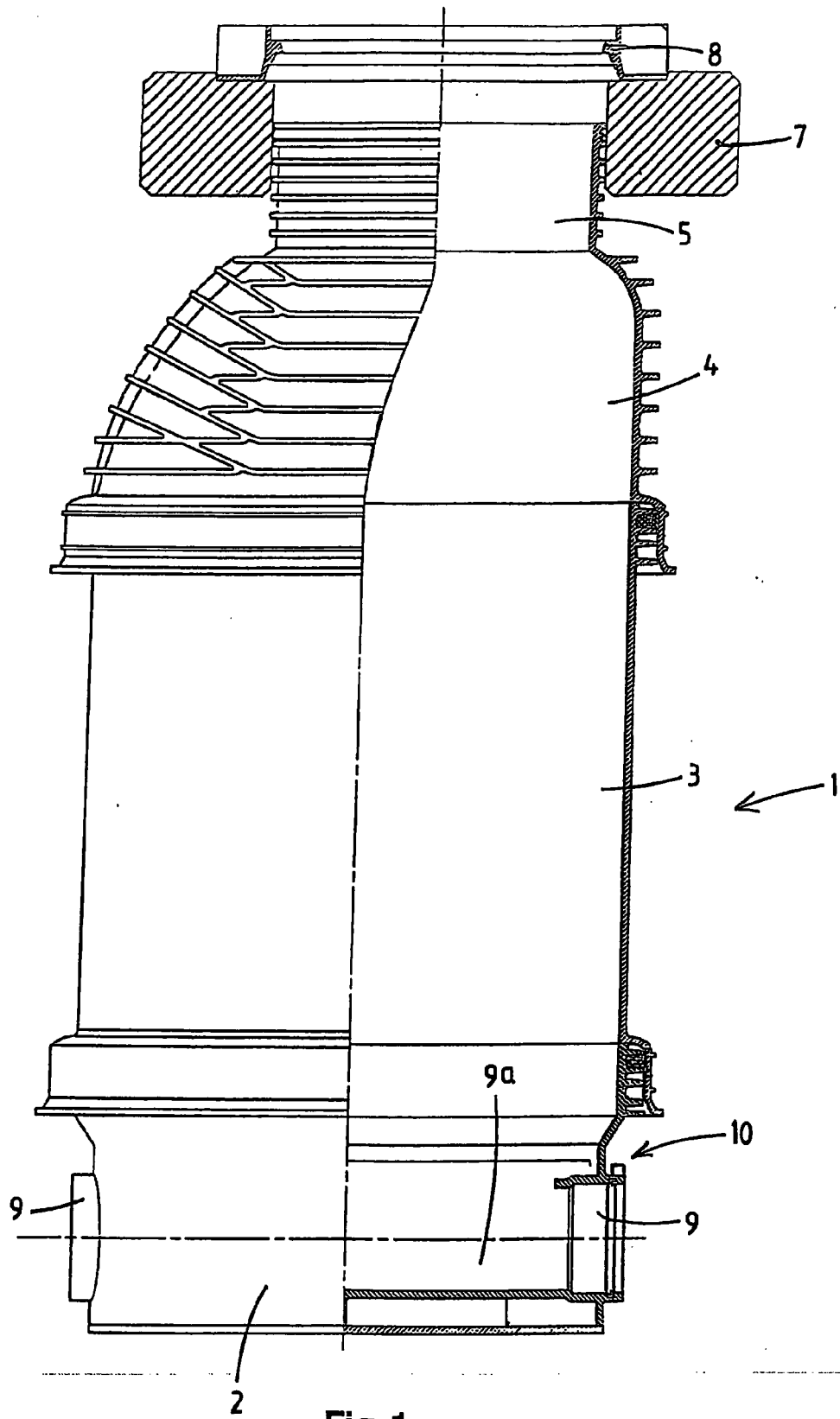
**[0042]** In a sewer and rainwater drainage gully with a bottom element and one or more elements which can be stacked on top of said bottom element it is preferable for at least the bottom element to be provided with one or more levelling devices. The shape of the elements to be stacked on said bottom element is then preferably such that the correct position of the bottom element also leads to the correct position of the elements stacked on it. Of course, it is also possible, if desired, to provide one or more of the elements to be stacked on said bottom element with one or more levelling devices of their own, in order to rule out faults in the mutual stacking.

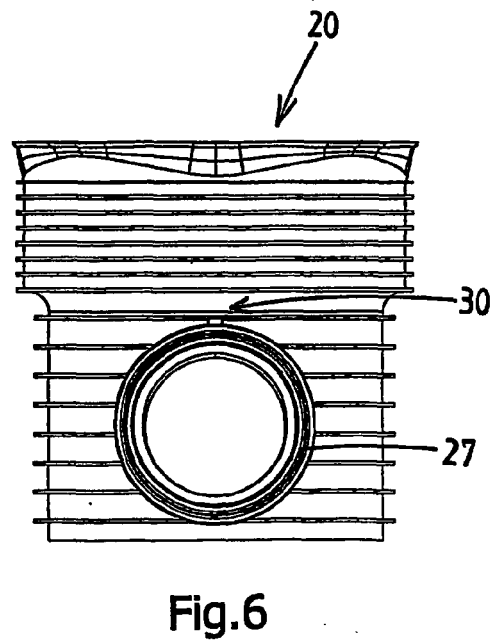
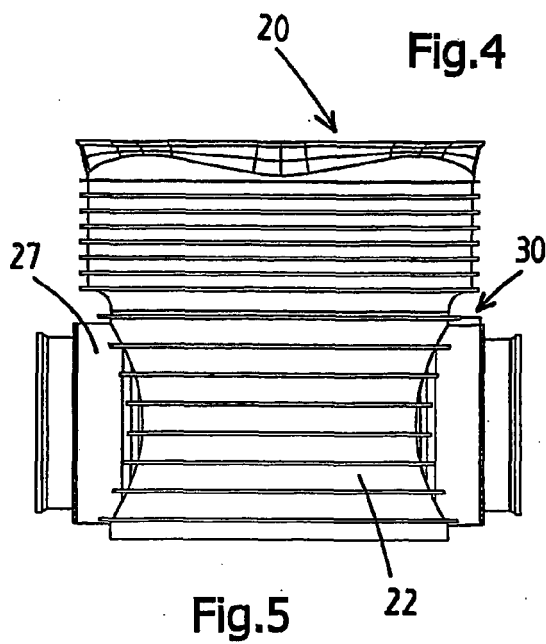
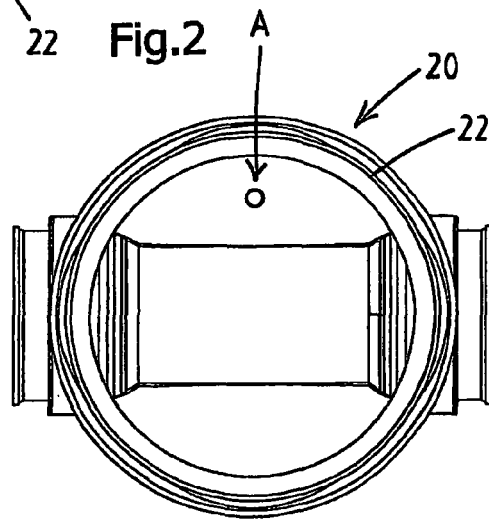
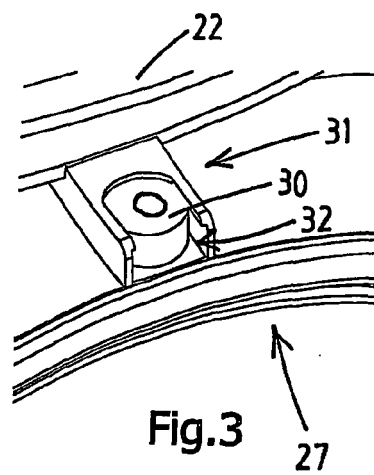
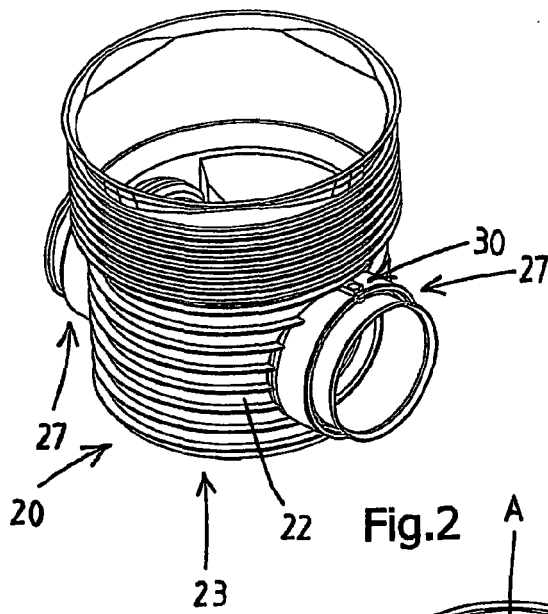
**[0043]** It will be clear that the sewer and rainwater drainage gully can be installed at a location in the ground as part of a drainage system comprising one or more of said gullies and also one or more pipes which connect to the one or more gullies. For this purpose, holes and/or trenches for placing of the gully elements and pipes can be made, the gullies and pipes can be placed, and the holes and/or trenches can be filled up again. The placing of the gully in the correct position is made much easier here by the fact that the gully, or an element of said gully, is provided with one or more levelling devices, preferably at the place of production of the gully elements.

## Claims

1. Sewer and rainwater drainage gully element (2; 20) of a sewer and rainwater drainage gully (1) to be placed in the ground, to which gully (1) one or more pipes can be connected for the purpose of draining away liquid arriving in the gully through a gully opening which may be present, and/or for the purpose of ensuring that liquid arriving at the gully through one or more pipes connected to the gully is carried on to one or more other pipes connected to the gully, **characterized in that** the sewer and rainwater drainage gully element is provided with at least one levelling device (10; 30).
2. Sewer and rainwater drainage gully element according to claim 1, in which the levelling device (30) is fitted detachably on the gully element.
3. Sewer and rainwater drainage gully element according to claim 1 or 2, in which the levelling device (10; 30) is provided on the outside of the gully element.
4. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the levelling device is a spirit level (10; 30) filled with liquid in which an air bubble is present.
5. Sewer and rainwater drainage gully element according to claim 4, in which the spirit level (10; 30) is a round spirit level.
6. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the levelling device is provided with an indication of the actual angle of inclination in one or more directions.
7. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the gully element is a gully bottom element (2; 20) which is provided with one or more connections (9; 27) for pipes.
8. - Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the gully element (2; 20) is made of plastic.
9. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the gully element (20) is provided with a retaining mechanism, for example a clamping mechanism (31), in which the levelling device (30) is retained.
10. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the gully element (20) is provided with an opening (31) in which the levelling device is accommodated.

11. Sewer and rainwater drainage gully element according to claim 10, in which the opening accommodates the levelling device in a recessed manner relative to the surrounding area. 5
12. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the levelling device is fixed on the gully element by means of an adhesive connection, for example a self-adhesive connection. 10
13. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the gully element has a connecting socket (9; 27) for a pipe, preferably an outwardly projecting connecting socket, a levelling device (10; 30) being fitted on the outside of the gully element near the connecting socket, possibly on top of the outwardly projecting connecting socket. 15  
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14. Sewer and rainwater drainage gully element according to one or more of the preceding claims, in which the gully element is a gully bottom element (20) with one or more connecting sockets for pipes, and with a floor in the interior of the gully bottom element, which floor forms one or more channels which are open at the top between the one or more connecting sockets, one or more levelling devices being fitted in or on the floor. 25  
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15. Sewer and rainwater drainage gully (1) to be placed in the ground, provided with a gully element, for example a gully bottom element, according to one or more of the preceding claims. 35
16. Method for installing a sewer and rainwater drainage system at a location in the ground, comprising one or more sewer and rainwater drainage gullies each having one or more sewer and rainwater drainage gully elements according to one or more of the preceding claims and also one or more pipes which connect to the one or more sewer and rainwater drainage gullies, which method comprises making holes and/or trenches for placing of the sewer and rainwater drainage gully elements and pipes, placing of the sewer and rainwater drainage gullies and pipes, and filling up of the holes and/or trenches, one or more sewer and rainwater drainage gully structure elements according to the invention prior to placing in the corresponding holes and/or trenches being provided with one or more levelling devices, preferably at the place of production of the sewer and rainwater drainage gully structure elements, which levelling devices are used for placing the sewer and rainwater drainage gully structure elements in the correct position. 40  
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European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 08 07 5065

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E03F E02D G01C F16L
Place of search		Date of completion of the search	Examiner
The Hague		14 May 2008	Van Bost, Sonia
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EPO FORM 1503 03.82 (P04C01)



**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 08 07 5065

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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**REFERENCES CITED IN THE DESCRIPTION**

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